DOUBLE CHECK VALVES ON WATER SUPPLIES[1]

MR. J. W. ACKERMAN:[2] About eight years ago the city of Auburn, N. Y., experienced difficulty with a certain plant that had a fire protection system and a large yard area. The area of the yard was so large that the supplies for the different mills inside the yard were taken direct off of the yard system; that is, the fire protection system and the mill supply were not separated in the sense that there was a distinct line coming from the city main for fire protection and a distinct line from the city main for mill and industrial use. The factory employees complained that on fire drills the water tasted badly. When the whistle blew for fire drills, they would immediately draw some water so that it would not taste badly. The water for the secondary or auxiliary supply came from a large cistern not necessarily polluted, but of course brackish water. This led to an investigation, and we found that the water from the fire pump was backing up through the check valves and into this general yard system. It was not necessarily polluting it with infectious germs, but it made the water taste. Then the entire city was looked over and it was found that nearly all of the check valves had been buried and forgotten and that they were single check valves of the normal commercial type. The governing board of the water department felt that this was so vital that they ordered all of the fire protection system disconnected. Of course that brought about immediately a protest from the manufacturers and from the insurance interests. There was then a joint meeting with all parties interested, and what we call in our section the Boston Mutuals, which is the Mutual Manufacturers' Association, came to the front and designs were submitted and tested. A new kind of a check valve was developed, the interior of which had all of its working parts of bronze with liberal clearances, so that tubercles would never hold a clapper open. This investigation went on something over a year, with sanitary engineers testing and trying out the system. It finally came about that these

[1] Discussion at the Cleveland Convention, June 9, 1921. Further discussion is desired and should be sent to the Editor.

[2] Superintendent, Water Board, Watertown, N. Y.

were approved by the State Board of Health. The State Board of Health of New York State is advising all of the municipalities to test and inspect these check values and that they should be so installed that they can be tested and inspected. That means that they must be placed in accessible pits and must be tested yearly. We felt that the only safe method of control is not only by frequent inspection, but also that the valve should be taken apart once a year and examined thoroughly, as the rubber facing on the valve is apt to deteriorate and to cause a leak. The valves are separated. They are always installed double and separated from one another, so that any stick which might get into the main which could get around the bend would not be long enough to hold both valves open at the same time.

The sanitary quality of the water of course is the first thing to be considered. Since fire protection is also a proper function, these two requirements should be coordinated so that both may be satisfactorily met. It was our experience during this period of years, that the only safe plan, however, is yearly inspection, taking the valves apart and testing them and repairing them. Such a procedure keeps before one the fact that the valve is there and must be watched. With those precautions taken, I believe it has been stated that the loss of life from infection has been brought down to the point of being less than the loss of life from conflagration.

MR. H. A. BURNHAM:[3] I am very glad Mr. Ackerman has touched on a little of the early history of the development of this device. During the winter I had the pleasure of presenting to the Canadian Section of this Association a concise outline of this entire question, and that paper has been printed in the last number of the JOURNAL.[4] There is one thing that I wanted to make clear in the handling of this device, and this is that you cannot expect the best results from it unless all other use of water is disconnected from the supply system within the property. I find in going about the country on fire protection work, that there is a great need of better understanding and regulation between the water consumer and the water department regarding the fire service connections. I believe that if this one thing were kept in mind, that the fire service connections should always be independent of all other connections within the property,

[3]Engineer and Superintendent, Factory Mutual Fire Insurance Co., Boston, Mass.

[4]See JOURNAL, May, 1921, page 222.

that there would never be occasion to put aside the performance of these check valves. I should like very much to hear from any of the superintendents who have had these valves under their charge, what their experience has been with them, because this matter of fire protection is of vital importance. We feel that if the sanitary engineers do not cooperate fully with the fire protection engineers, that the best results cannot be obtained.

MR. D. R. GWINN:[5] Last year I wrote to a firm of prominent valve manufacturers asking if they manufactured a check valve which could be considered as a safe appliance to put on a private fire line, to prevent the flow of water from the secondary system into the mains of the company. I had a letter in reply from the vice-president to the effect that he did not think it was possible to construct such a valve and that he did not know of such a valve. Personally, I believe that there should be no connection between the public water system and a private water system. I am not, however, always consistent in that belief; I have been persuaded several times to permit connections to be made. Where I put in the double check valve, however, I felt satisfied that the secondary source of supply was reasonably pure and could be depended upon. The best plan I have heard of in this connection was one Mr. Davis, of Richmond, suggested. I would be glad to have him tell you how he fixed it in Richmond.

MR. E. E. DAVIS:[6] That is very easily explained. We had oceans of trouble down there and everybody wanted to connect their well or spring or stream into a tank that would be connected with the fire system. I found a place once that was so connected, but the valve leaked, and I have had other places where the valve leaked. I have yet to find the place in my experience where the water did not get by the valve. The great trouble about it is that it is the face of the valve, the adhesion of the clapper of which Mr. Ackerman told. It is one of the hardest things in the world to get a tight joint when it is automatic. We had trouble with check valves and the Council passed an ordinance prohibiting any connection between a well or stream and the city supply. We are requiring a weighted check valve on the main line with a by-pass meter on all sprinkler

[5] President, Water Company, Terre Haute, Ind.
[6] Division Superintendent, Bureau of Water, Richmond, Va.

head systems where a fire connection is made and water is used for other purposes. The ordinance requires a meter the same size as the connection. The only suggestion I have to make to the waterworks people—my experience in waterworks will be forty-nine years on September 28—is that I have yet to be convinced that it is a good idea to connect any other system of water with the city system. If you want it safe, cut loose.